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EXAMINER	
KNIGHT, DEREK DOUGLAS	

ART UNIT	PAPER NUMBER
3655	

NOTIFICATION DATE	DELIVERY MODE
04/30/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/555,728	MARTIN, WILLIAM WESLEY	
	Examiner	Art Unit	
	DEREK D. KNIGHT	3655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-26 and 34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5, 7-26 and 34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-5, 7-26 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The applicant has used the phrase “a method of performing a downshift” to change the pending claims from disclosing an apparatus to disclosing a method, however, the applicant has not actually disclosed any steps in this method. It is unclear to the examiner what the actual steps are to perform the down shift, it is also unclear as to what structure would be used to perform the undisclosed steps.

It is acceptable to have a “step of providing structure”. Also changing verbs such as "move" to --moving-- or "engages" to --engaging-- would assist in determining what the applicant views as the steps of their invention.

Claim 1 recites the limitation "the backlash" in line 13. There is insufficient antecedent basis for this limitation in the claim. Also, it is unclear as to what elements the backlash is between.

Claim 1 recites the limitation "the engaged gear wheel" in line 15. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "the unengaged gear wheel" in line 17. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "a downshift" in lines 18 and 21. It is unclear to the examiner if this is the same down shift disclosed in lines 1 and 2 of the same claim.

Claim 18 recites the limitation "the members" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5, 7-19, 21-24, 26 and 34 rejected under 35 U.S.C. 103(a) as being unpatentable over **THOMAS (US 3,872,737)**.

Section 2112.02 of the MPEP states, "Under the principles of inherency, if a prior art device, in its normal and usual operation, would necessarily perform the method claimed, then the method claimed will be considered to be anticipated by the prior art device."

Regarding claim 1, THOMAS discloses a method for performing a downshift in a transmission system including first (21) and second (10) rotatable shafts, said first shaft having a longitudinal axis, and means (the gears and shifting mechanisms between the gears) for transferring drive from one of the shafts to the other shaft comprising first (27) and second (29) gear wheels each rotatably mounted on the first shaft and having drive formations (59) formed thereon, a selector assembly (comprising (49), (38), (36), (37) and (59)) for selectively transmitting torque between the first shaft

and the first gear wheel and between the first shaft and the second gear wheel, wherein the selector assembly comprises an actuator assembly (comprising of 66) and first (36) and second (37) sets of engagement members that are moveable into and out of engagement with the first and second gear wheels independently of each other, said actuator assembly being arranged to move the first and second sets of engagement members in first and second directions along the longitudinal axis of the first shaft, and when one of the first and second gear wheels is selected by the first and second sets of engagement members, and when a driving force is transmitted, one of the first and second sets of engagement members drivingly engages an engaged gear wheel, and the other set of engagement members (37) is then in an unloaded condition, wherein the actuator assembly moves the unloaded set of engagement members (37) into driving engagement with the unengaged gear wheel to effect a downshift.

THOMAS discloses the claimed invention except for the backlash being less than or equal to four degrees when moving between acceleration and deceleration.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to limit the backlash to such a range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 105 USPQ 233.

Regarding claim 2, THOMAS discloses the selector assembly is arranged such that when a braking force is transmitted the first set of engagement members (36) (when the transmission is in 1st gear, that is gear (29) is engaged. As seen in Fig. 2)

drivingly engages the engaged gear wheel (29) (via 43), and the second set of engagement members (37) is in an unloaded condition, and when a driving force is transmitted the second set of engagement members (37, via 61) drivingly engages the engaged gear wheel, and the first set (36) of engagement members is then in an unloaded condition.

Regarding claim 3, THOMAS discloses the actuator assembly is arranged to bias the loaded set of engagement members towards the unengaged gear wheel without disengaging the loaded set of engagement members from the engaged gear wheel. This occurs during the shifting operation via the spring (47).

Regarding claim 4, THOMAS discloses the first and second sets of engagement members are arranged to rotate, in use, with the first shaft. See Fig. 1.

Regarding claim 5, THOMAS discloses the first shaft is an input shaft and the second shaft is an output shaft and drive is transferred from the input shaft to the output shaft. This occurs during deceleration conditions, when the wheels are actually turning the transmission.

Regarding claim 7, THOMAS discloses the drive formations on the first and second gear wheels comprise a first and second group of dogs respectively. The dogs are not numbered, but springs (54) are resting against the dog members. See Fig. 6 of THOMAS.

Regarding claim 8, THOMAS discloses the first and second groups of dogs each comprise between two and eight dogs, evenly distributed on the first and second gears respectively.

Regarding claim 9, THOMAS discloses the first and second groups of dogs each comprise between two and four dogs.

Regarding claim 10, THOMAS discloses the first and second sets of engagement members comprise between two and eight members.

Regarding claim 11, THOMAS discloses the first and second sets of engagement members comprise between two and four members.

Regarding claim 12, THOMAS discloses the first shaft comprises keyways (41) arranged such that the first and second sets of engagement members can slide axially along the keyways and to radially restrain the positions of the sets of engagement members.

Regarding claim 13, THOMAS discloses a cross-section of the keyways is one of T-shaped, slotted, and dovetailed.

Regarding claim 14, THOMAS discloses the actuator assembly comprises at least one resiliently deformable means (47) arranged to move at least one of the first and second sets of engagement members into engagement with the first and second gear wheels when the engagement members are in unloaded conditions.

Regarding claim 15, THOMAS discloses the at least one resiliently deformable means is arranged to bias at least one of the first and second sets of engagement members towards the first or second gear wheel when the engagement members are drivingly engaged with a gear wheel.

Regarding claim 16, THOMAS discloses the actuator assembly comprises first and second resiliently deformable means (47) connected to the first and second sets of

engagement members respectively such that the first resiliently deformable means acts on the first set of engagement members and the second resiliently deformable means acts on the second set of engagement members.

Regarding claim 17, THOMAS discloses the at least one resiliently deformable means is connected to the first and second sets of engagement members such that the resiliently deformable means acts on both the first and second sets of engagement members.

Regarding claim 18, THOMAS discloses the members of the first and / or second sets of engagement members can perform limited axial movement relative to each other in the keyways.

Regarding claim 19, THOMAS discloses the resiliently deformable means is a spring.

Regarding claim 21, THOMAS discloses the actuator assembly comprises a fork that is arranged to engage the at least one resiliently deformable means to move the at least one resiliently deformable means axially along the first shaft.

Regarding claim 22, THOMAS discloses the drive formations are arranged such that they do not extend beyond the outside diameter of the gear wheels.

Regarding claim 23, THOMAS discloses the first and second groups of dogs each comprise three dogs. See Fig. 6 of THOMAS.

Regarding claim 24, THOMAS discloses the first and second sets of engagement members comprise a plurality of members.

THOMAS does not disclose there being three members.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have three members, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 26, THOMAS discloses briefly interrupting torque in the transmission to allow disengagement of the engaged gear wheel prior to the shift, and then selecting the unengaged gear wheel.

Regarding claim 34, THOMAS discloses the first and second sets of engagement members are substantially identical but opposite handed.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over **THOMAS (US 3,872,737)** as applied to claims 1-5, 7-19, 21-24, 26 and 34 above, and further in view of **THOMAS (US 4,098,380).**

THOMAS _737 discloses a transmission system having resiliently deformable means (47) which are springs.

THOMAS _737 does not disclose the springs being disc springs.

THOMAS _380 teaches a transmission system having resiliently deformable means as disc springs (76)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the springs of THOMAS _737 to be disc springs in view of THOMAS _380 in order to save space within the transmission system, because disc springs occupy less axle space than coil springs allowing for a more compact, space-saving design.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over **THOMAS (US 3,872,737)** in view of **THOMAS (US 4,098,380)** as applied to claim 25 above, and further in view of **MILLER (US 4,241,818)**.

The combination of THOMAS - THOMAS discloses a disc spring within a transmission system.

The combination of THOMAS - THOMAS does not disclose the disc spring comprising a plurality of arms, each arm having a first part that extends circumferentially around a portion of the disc spring and a second part that extends substantially radially inwards.

Miller teaches a disc spring (42) having a plurality of arms (44), each arm having a first part that extends circumferentially around a portion of the disc spring and a second part that extends substantially radially inwards (see Fig. 3 of Miller).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the disc spring of the combination of THOMAS - THOMAS such that the disc spring would have arms in view of MILLER to achieve various spring characteristics.

Response to Arguments

Applicant's arguments filed 2/4/2009 have been fully considered but they are not persuasive. Applicant argues that the transmission system of Thomas '737 moves the "loaded" stop members (43) out of engagement with the second gear (27) when performing a downshift. Examiner disagrees. While the members (61) are engaged with the gear wheel via the projections (59), the shift fork (66) is moved to the right,

allowing the member (37) to assume a position in which it can drive the gear (29). Please see column 6, lines 33-56 for a more detailed description.

Applicant argues that it is not possible to initially engage the connector elements (59) with the stop members (43). This is not the disclosed function of the prior art. During a shift, it is the members (61) that make initial contact with the elements (59).

Applicant argues that the backlash being less than or equal to four degrees is an important aspect of the current application. There has been no evidence provided which would lead one of ordinary skill to believe that the backlash range which is claimed has been chosen because of unexpected results.

Applicant argues that claim 6 was not addressed in the previous office action. Examiner directs applicant to page 9 of that action.

Applicant argues that the number of engagement members is an important aspect of the current application. There has been no evidence provided which would lead one of ordinary skill to believe that the number of engagement members which is claimed has been chosen because of unexpected results

Applicant argues that the disc spring of Thomas '380 only holds the shift fork in a centralized location. Thomas '380, discloses another function of the spring in column 3, lines 34-40 which is the same as the springs of the current application.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEREK D. KNIGHT whose telephone number is (571)272-7951. The examiner can normally be reached on Mon - Friday, 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles A. Marmor can be reached on (571) 272-7095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. D. K./
Examiner, Art Unit 3655

/CHARLES A. MARMOR/
Supervisory Patent Examiner, Art Unit 3655